

WHAT IS CLAIMED IS:

1. A needle assembly comprising an infusion needle having a passageway and at least one needle cannula having a distal tip, at least one of said cannula, while in an unconstrained configuration having at least one preformed bend and being constrainable to a second configuration whereby upon release of external constraint, said cannula substantially returns to the unconstrained configuration.

2. The needle assembly of claim 1, wherein the constrained configuration is substantially straight.

3. The needle assembly of claim 1, further comprising a coaxial outer cannula for constraining the cannula with preformed bends into the second configuration.

4. The needle assembly of claim 1 wherein the preformed bend cannula comprises a superelastic material.

5. The needle assembly of claim 4 wherein the superelastic material includes a Ni-Ti alloy.

6. The needle assembly of claim 4 whereby the preformed bend is induced by mechanical deformation such that the superelastic material includes a martensitic crystalline structure, while non-mechanically deformed portions of the needle cannula comprise a substantially austenitic crystalline structure.

7. The needle assembly of claim 1 further comprising an inner needle introducer stylet having a stylet shaft which is insertable into the passageway of the infusion needle.

8. The needle assembly of claim 1 wherein the stylet shaft comprises a flexible polymeric material.

9. The needle assembly of claim 1 wherein the infusion needle includes a needle cannulae.

10. The needle assembly of claim 9 wherein the plurality of needle cannulae radiate outward from a proximal cannula forming a multiple needle assembly.

11. The needle assembly of claim 9 wherein the multiple needle assembly includes both at least one proximally-located needle and at least one distally-located needle.

12. The needle assembly of claim 11 further including a coaxial outer cannula for constraining the preformed and bent one needle cannula into the second configuration, the outer cannula having at least one side hole for deployment of at least one of the proximally located needles therethrough.

13. The needle assembly of claim 11 further comprising an introducer cannula for selectively exposing side holes for deployment of a proximally located needle.

14. The needle assembly of claim 1 wherein the infusion needle further comprises a plane indicator for indicating the direction of a preformed bend of the needle cannula.

15. A needle assembly comprising:

(a) an infusion needle comprising at least one needle cannula made of a superelastic material, having at least one preformed bend while in its unconstrained configuration; and

(b) a coaxial outer cannula having a distal end and passageway therethrough, the infusion needle being adapted to be disposed inside the passageway of the coaxial outer cannula to constrain the infusion needle into the second configuration;

(c) the infusion needle being slidably deployable from the distal end of coaxial outer cannula whereby at release of constraining forces, the at least one needle cannula substantially returns to the unconstrained configuration.

16. The needle assembly of claim 15 wherein the distal end of the coaxial outer cannula includes a sharpened tip adapted for the penetration of tissue.

17. The needle assembly of claim 15 wherein the coaxial outer cannula further includes an outer cannula introducer stylet insertable into the passageway of the coaxial outer needle such that the coaxial outer needle and an outer cannula introducer stylet comprise an outer needle assembly adapted for insertion into the body of a patient.

18. The needle assembly of claim 15 wherein the superelastic material includes a Ni-Ti alloy.

19. The needle assembly of claim 4 whereby the preformed bend is induced by mechanical deformation of the needle cannula such that the superelastic material of the at least one preformed bend includes a martensitic crystalline structure, while non-mechanically deformed portions of the needle cannula comprise a substantially austenitic crystalline structure.

20. The needle assembly of claim 14 wherein the infusion needle and coaxial outer cannula are interconnected by a coaxial handle.

21. A needle assembly comprising:

an infusion needle having a plurality of needle cannulae each having a distal tip, the plurality of needle cannulae while in their unconstrained configuration having a preformed bend with an angle within a range from 40 to 90°, the preformed bends being mechanically-induced martensite with straight portions of said inner hollow cannula comprised of austenitic state Ni-Ti alloy, the plurality of needle cannulae constrainable to a second configuration that is substantially straight, whereby upon release of external constraining forces, the plurality of needle cannulae substantially return to their unconstrained configuration, the infusion needle comprising a Ni-Ti alloy, the preformed bends of the plurality of needle cannulae induced by mechanically deforming the needle cannula, each preformed bend includes a martensitic crystalline structure, while non-mechanically deformed portions of the needle cannulae comprise a substantially austenitic crystalline structure;

a coaxial outer cannula having a distal end and passageway therethrough, the infusion needle adapted to be disposed thereinside the passageway of the coaxial outer cannula to constrain the infusion needle into the second configuration; the infusion needle being slidably deployable from the distal end of coaxial outer cannula whereby at release of constraining forces the plurality of needle cannulae substantially return to their unconstrained configuration;

an inner needle introducer stylet having a stylet shaft, the stylet shaft being insertable into the passageway of the infusion needle;

and an outer cannula introducer stylet that is insertable into the passageway of the coaxial outer needle such that the coaxial outer needle and outer cannula

introducer stylet comprise an outer needle assembly adapted for insertion into the body of a patient.